The Effects of Recorded Aural Models on the Performance Achievement of Students in Beginning Band Classes

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Article:

Identification of the Problem. Beginning wind instrument students often learn to play their instruments in large, mixed-instrument classes in which the teacher does not demonstrate on each student's instrument, or perhaps on any instrument. Thus, many students learn to play without hearing how their instrument should sound. In the absence of live demonstrations, aural models recorded on tape provide one way of supplying students with models. Research has indicated that aural models are effective when used by individuals. However, there is little evidence available to indicate whether aural models presented in group listening sessions are effective.

The Purpose of the Experiment. The purpose of this experiment was to determine the effects of recorded aural models on the performance achievement of students in beginning band classes when these models were presented during rehearsals. Specific effects were determined by seeking answers to the following questions:

1. Were there any significant differences (p = .05) between students in experimental groups (with aural models) and students in control groups (without aural models) in terms of these performance skills?
   (a) tone quality
   (h) pitch accuracy
   (c) rhythm accuracy
   (d) tempo stability
   (e) dynamics
   (f) total performance
(f) (all measured skills combined)

2. Were there any significant differences between students in experimental groups and students in control groups when comparisons were made in terms of the following instrumental groups?
   (a) flutes
   (b) clarinets
   (c) alto and tenor saxophones
   (d) comets and trumpets
   (e) trombones and baritones

3. Were there any significant differences in performance and achievement between or within experimental and control groups after students were placed into one of three academic achievement levels arbitrarily designated as high, medium, and low?

The Design of the Experiment. Two hundred beginning band students from fourteen band classes in two schools participated in an experiment designed to determine the effects of aural models. Seven classes, four from School A and three from School B, were designated experimental groups and an equal number of classes

from each school were designated control groups. Table 1 indicates the number of students in each instrumental category and class. All groups used the Easy Steps to the Band method book. All of the students in School A were taught by one teacher and all of the students in School B were taught by one teacher. No comparisons were ever made between School A and School B; comparisons were only made between each school's experimental and control group.

Both teachers made an effort to teach their experimental and control groups the same, except for the use of aural models in the experimental groups. These aural models were tape recordings, made by professional artists, which contained model performances of selected exercises taken from Easy Steps to the Band. Instruments represented on the tape were flute, clarinet, alto saxophone, horn, trumpet, and trombone.

Students in experimental groups heard these tapes in nearly every rehearsal during a fourteen-week period. The exercises represented on the tape kept pace with the materials on, which the students were working. Moreover, students heard each of the six instruments every time the tapes were played.

At the end of the fourteen-week period, all students performed three etudes. Etude One was Home on the Range and each student had one week to prepare it with the music. In addition, experimental group students heard the melody played on tape by all six instruments. Etude Two was an eight-measure exercise written especially for this experiment. Although each student had one week to prepare it with the music, none of them heard a model performance of this etude. Etude Three was a specially composed sight-reading exercise. None of the students heard or saw it before they performed it.

TABLE 1. Description of the Population

Students in School A Band Classes										
Experimental Groups						Control Groups				
	1	2	3	4	total	1	2	3	4	total
flutes	2	6	1	2	11	5	6	3	5	19
clarinets	5	9	5	7	26	3	5	4	4	16
saxophones	1	1	0	3	5	2	0	2	2	6
horns	0	2	3	0	5	0	0	0	2	2
cornets	4	4	7	4	19	2	5	3	2	12
trombones	0	0	3	1	4	1	4	1	2	8
total	12	22	19	17	70	13	20	13	17	63

Students in School B Band Classes								
Experimental Groups					Control Groups			
	1	2	3	total	1	2	3	total
flutes	3	3	2	8	3	4	3	10
clarinets	2	2	3	7	2	5	6	13
saxophones	1	0	1	2	0	1	2	3
horns	0	0	0	0	1	1	0	2
cornets	4	4	0	8	4	2	1	7
trombones	0	2	0	2	1	4	0	5
total	10	11	6	27	11	17	13	40

All etude performances were recorded on tape and later evaluated by three expert judges. The judges used a rating sheet which places tone quality, pitch accuracy, rhythm accuracy, tempo stability, and dynamics on a five-point scale. Inter-judge reliability figures, based on each judge's ratings of 30 performances of Etude Two, ranged from .795 to .858. Intra-judge reliability figures were obtained by having each judge rate 30 etudes on two occasions. These figures ranged from .860 to .943.

Additional data included California Achievement Tests with separate scores for reading and arithmetic achievement; these scores were obtained from school records. The original purpose for obtaining these test scores was to use them as covariates in the analysis of performance achievement. However, in order to use the analysis of variance and covariance technique, independent and dependent variables must be significantly related. Correlation coefficients between academic achievement and performance achievement showed a lack of relationship between the variables; thus, covariate analysis could not be used with these data.

In order to determine whether there were any significant differences between experimental and control groups

in terms of academic achievement, *t* tests were used to compare the groups from both schools in terms of reading and arithmetic achievement. As Table 2 indicates, no significant differences were found in any of the comparisons made. Also, the number of students taking either piano lessons or private lessons on their band instruments were found to be similar for experimental and control groups. Thus, for the purposes of further analysis, experimental and control groups were considered equal in terms of the data available.

Results and Conclusions. Because of the limitations of space, detailed results of the various statistical tests have not been included in this paper. However, a discussion of the results is included in the section which follows.

The first research question was answered by comparing experimental and control group means on each of the performance factors by means of *t* tests. This was done for each etude separately and for the etudes combined. All of the *t* values obtained were nonsignificant; no statistically significant differences were found on any of the measured performance skills. Based on the results of Question One, the conclusion was reached that aural models, as they were prepared and used in this experiment, were not effective in the improvement of tone quality, pitch accuracy, rhythm accuracy, tempo stability, dynamics, or total performance.

TABLE 2. Comparisons of Experimental and Control Groups on Academic Achievement

Variable	Group	N	Mean	S.D.	df	*t* value	
READING	A, Exp.	70	49.69	14.58	131		NS
READING	A, Con.	63	51.71	12.45		−.2215	NS
ARITHMETIC	A, Exp.	70	43.66	13.94	131	.2000	NS
ARITHMETIC	A, Con.	63	41.87	13.44			NS
READING	B, Exp.	27	44.59	15.79	65		NS
READING	B, Con.	40	46.85	16.23		−.1834	NS
ARITHMETIC	B, Exp.	27	36.22	13.06	65		NS
ARITHMETIC	B, Con.	40	42.85	12.29		−.6200	NS

The second question, too, was answered by using *t* tests to compare group means. However, it was necessary to combine the students into woodwind and brass groups rather than individual instruments in order to obtain numbers large enough to make meaningful comparisons.

Experimental and control woodwind groups were compared on all five performance skills and on total performance for each etude separately and for the etudes combined. In each comparison the *t* value was nonsignificant. There were no statistically significant differences between any of the woodwind groups in any of the comparisons made. The results were the same for brass groups. These results led to the conclusion that aural models were not effective for either woodwind or brass groups.

The third question answered by means of analysis of variance in a treatments-(experimental and control)-by-levels (high, medium, and low academic achievement) design. On the basis of their reading and arithmetic achievement scores, students wore placed into high, medium, or low groups. Then comparisons of performance achievement were made between and within experimental and control groups.

For the analysis of variance of performance achievement by mode of treatment and levels of reading achievement for School A, the *F* values were nonsignificant. No significant differences were found for treatments, for levels, or for the interaction. In the three remaining analyses of variance —for School B with reading achievement levels, and for both schools with arithmetic achievement levels—the *F* values for treatments and interactions were nonsignificant, The results led to the conclusion that experimental group students rated high, medium, or low in academic achievement did not benefit from hearing the aural models when compared to their control group counterparts in terms of performance achievement.

In these same three comparisons, the *F* for levels was significant. There were significant differences in performance achievement within experimental and control groups. Further analysis, using the Scheffe method

of comparison, revealed that for all three comparisons the differences existed only within control groups. No significant differences were found within experimental groups. For School B, with control groups divided by reading achievement levels, the only significant difference was between the high and low groups. For School A, with control groups divided by arithmetic achievement levels, the only significant difference was between the medium and low groups. For School B, with control groups divided by arithmetic achievement levels, the only significant difference was between high and low groups. These differences were minor and because they occurred only within control groups they do not alter the conclusion that aural models were not beneficial to experimental group students.

Discussion. For the most part, the aural models used in this experiment had no measurable effects on performance achievement. The question which immediately arises is, why were there no differences? Or stated another way, why were the aural models ineffective? Possible explanations might include the quality of the tapes and playback equipment, the length of time, in terms of weeks, that aural models were used, and the attitudes of the teachers who used the tapes. However, from observations, the most important reasons might be the amount of class-time given to the use of the models and the quality of that time in terms of invigorating teacher-student relationships.

Each class met for only forty minutes every other school day. During this limited time, the students had to arrive from regular classes, unpack their instruments, get seated, and warm-up, as well as study their regular lesson and go through the dismissal process. Obviously, the teachers did not have a great amount of extra time to devote to an experimental treatment. The usual time spent in listening to the aural models was only three to five minutes per class meeting. Perhaps, more time needs to be spent in listening to aural models before they will be effective.

Also, if the students had been more actively involved in listening to these tapes and in making comparisons between their trials and the model performances, the results of this experiment might have been different. No curriculum change or new teaching technique will be effective unless the teacher who uses it is a motivating and skillful teacher. From this, a final comment might be made that if aural models are to be effective, they must be used in more than a cursory manner. Merely playing tapes to a group of students without more active, directed listening will not be enough to make them effective.

References

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